Claims

1. A mobile station which sends a transmission request for permission to transmit packet data to a base station and transmits said packet data to said base station according to transmission schedule information about a transmission schedule which said base station determines in response to said transmission request, characterized in that said mobile station comprises:

a transmitting unit for transmitting said transmission request for permission to transmit packet data to said base station, and for transmitting said packet data to said base station;

a receiving unit for receiving said transmission schedule information from said base station, and for receiving a result of judgment of reception of said packet data which is transmitted to said base station by said transmitting unit; and

a control unit for controlling said transmitting unit so that said transmitting unit transmits a transmission request for permission to transmit new packet data before said receiving unit completes the reception of said reception judgment result.

2. The mobile station according to Claim 1, characterized in that said mobile station includes a transmission data storage unit for temporarily storing packet data which is to be transmitted to the base station, a multiplexing unit for multiplexing the transmission request and the packet data which are to be transmitted to said base station, and for delivering them to the transmitting unit, and a demultiplexing unit for delivering the transmission schedule information and the

reception judgment result which are furnished thereto from the receiving unit to the control unit, and characterized in that said control unit controls the transmission of the transmission request and the packet data to said base station based on an amount of packet data stored in said transmission data storage unit, and the transmission schedule information notified from said base station, and instructs said multiplexing unit to generate the transmission request for permission to transmit new packet data so as to transmit this transmission request to said base station before said receiving unit completes the reception of the reception judgment result indicating judgment of reception of the transmitted packet data from said base station.

3. The mobile station according to Claim 1, characterized in that when the result of judgment of reception of the transmitted packet data from said base station indicates that the reception has failed, the control unit controls the transmitting unit so as to cause it to transmit said packet data to said base station again, and to transmit the transmission request for permission to transmit new packet data to said base station again.

4. The mobile station according to Claim 2, characterized in that transmission and reception of data between the mobile station and the base station are carried out in units of each of N subframes into which each frame is time-divided, and the time division number N is set so that the transmitting unit transmits the transmission request for permission to transmit new packet data to be transmitted for the next time to said base

station before the receiving unit completes the reception of the reception judgment result indicating judgment of reception of the transmitted packet data from said base station.

5. The mobile station according to Claim 4, characterized in that the multiplexing unit multiplexes the transmission request information which is to be transmitted to the base station using code multiplexing, and the generated transmission request has a length longer than frame lengths of other transmission data and received data.

6. The mobile station according to Claim 4, characterized in that the multiplexing unit multiplexes the packet data to be transmitted to the base station using code multiplexing, and the generated packet data has a length longer than frame lengths of other transmission data and received data.

7. The mobile station according to Claim 4, characterized in that the multiplexing unit generates a complex number signal by I/Q multiplexing the transmission request and the packet data which are to be transmitted to the base station, so as to time-multiplex them simultaneously.

8. The mobile station according to Claim 7, characterized in that the time division number N is an even number, and the multiplexing unit divides a channel via which either the transmission request or the packet data is to be transmitted to the base station into two parts and assigns them to an I-axis and a Q-axis of a complex number signal, respectively.

9. A base station which receives a transmission request for permission to transmit packet data from a mobile station, notifies transmission schedule information which said base station determines in response to said transmission request to said mobile station, and receives said packet data which is transmitted thereto by said mobile station according to said transmission schedule information, characterized in that said base station comprises:

a receiving unit for receiving said transmission request from said mobile station, and for receiving packet data which corresponds to said transmission request and which is transmitted by said mobile station;

a scheduling unit, responsive to a transmission request for permission to transmit new packet data which said receiving unit receives, for, when a result of judgment of reception of the packet data which is transmitted according to said transmission schedule information shows a failure of reception, assigning a transmission schedule to retransmission of said packet data which said receiving unit has failed to receive on a priority basis, and for creating information about said assigned transmission schedule; and

a transmitting unit for transmitting both the transmission schedule information created by said scheduling unit and said result of judgment of reception of the packet data to said mobile station.

10. The base station according to Claim 9, characterized in that said base station includes a multiplexing unit for multiplexing the transmission schedule information and the result of judgment of reception of the packet data which are

to be transmitted to said mobile station into a signal based on information furnished from the scheduling unit, and for furnishing the signal to the transmitting unit, and a demultiplexing unit for furnishing the transmission request furnished from the receiving unit to said scheduling unit, for determining whether the packet data furnished from said receiving unit has been received correctly, and for furnishing the result of judgment of reception of the packet data to said scheduling unit, and characterized in that said scheduling unit instructs said multiplexing unit to create the transmission schedule information again for the packet data which said receiving unit has failed to receive when the result of judgment of reception of the packet data furnished from the said demultiplexing unit shows that the reception of the packet data has failed.

11. A communication system in which a mobile station sends a transmission request for permission to transmit packet data to a base station and transmits said packet data to said base station according to transmission schedule information about a transmission schedule which said base station determines in response to said transmission request, and said base station transmits a result of judgment of reception of packet data which it has received to said mobile station, characterized in that said mobile station transmits transmission request information about new packet data which it will transmit to said base station next before completing reception of a result of judgment of reception of packet data which said mobile station has transmitted to said base station from said base station.

12. The communications system according to Claim 11, characterized in that when the result of judgment of reception of the packet data which said mobile station has transmitted to said base station shows that the reception of the packet data has failed, the mobile station transmits said packet data to said base station again, and transmits the transmission request information about new packet data which it will transmit to said base station next to said base station again.

13. The communications system according to Claim 11, characterized in that transmission and reception of data between the mobile station and the base station are carried out in units of each of N subframes into which each frame is time-divided, and in said mobile station the time division number N is set so that the transmitting unit transmits the transmission request for permission to transmit new packet data to be transmitted for the next time to said base station before the receiving unit completes the reception of the reception judgment result indicating judgment of reception of the transmitted packet data from said base station.

14. The communications system according to Claim 13, characterized in that the transmission request information or the packet data transmitted from the mobile station to the base station is multiplexed using code multiplexing, and said base station identifies time-divided subframes with a spread code of either said transmission request information or said packet data.

15. A CDMA (Code Division Multiple Access) communications

system in which a mobile station sends a transmission request for permission to transmit packet data to a base station and transmits said packet data to said base station according to transmission schedule information about a transmission schedule which said base station determines in response to said transmission request, characterized in that

said mobile station comprises: a transmitting unit for transmitting said transmission request for permission to transmit packet data to said base station, and for transmitting said packet data to said base station;

a receiving unit for receiving said transmission schedule information from said base station, and for receiving a result of judgment of reception of said packet data which is transmitted to said base station by said transmitting unit; and a control unit for controlling said transmitting unit so that said transmitting unit transmits a transmission request for permission to transmit new packet data before said receiving unit completes the reception of said reception judgment result,

and said base station comprises: a receiving unit for receiving said transmission request from said mobile station, and for receiving packet data which corresponds to said transmission request and which is transmitted by said mobile station;

a scheduling unit, responsive to a transmission request for permission to transmit new packet data which said receiving unit receives, for, when a result of judgment of reception of the packet data which is transmitted according to said transmission schedule information shows a failure of reception, assigning a transmission schedule to retransmission of said packet data which said receiving unit has failed to receive on

a priority basis, and for creating information about said assigned transmission schedule; and

a transmitting unit for transmitting both the transmission schedule information created by said scheduling unit and said result of judgment of reception of the packet data to said mobile station.

16. A communications method for use in a CDMA (Code Division Multiple Access) terminal which sends a transmission request for permission to transmit packet data to a base station and transmits said packet data to said base station according to transmission schedule information about a transmission schedule which said base station determines in response to said transmission request, characterized in that said communications method comprises:

a step of transmitting a transmission request for permission to transmit next packet data to said base station before receiving a result of judgment of reception of packet data which is transmitted to said base station last time from said base station;

a step of receiving transmission schedule information which corresponds to said transmission request from said base station; and

a step of transmitting the next packet data to said base station according to said transmission schedule information.

17. A communications method for use in a CDMA (Code Division Multiple Access) base station which receives a transmission request for permission to transmit packet data from a terminal, notifies transmission schedule information

which said base station determines in response to said transmission request to said terminal, and receives said packet data which is transmitted thereto by said terminal according to said transmission schedule information, characterized in that said communications method comprises:

a step of receiving said packet data from said terminal;

a step of receiving said transmission request from said terminal;

a step of, when a result of judgment of reception of said packet data shows a failure of reception, assigning a transmission schedule to retransmission of said packet data which said receiving step has failed to receive by making the retransmission a higher priority than a request for permission to transmit next packet data; and

a step of transmitting the transmission schedule information which corresponds to the retransmission of said packet data to said terminal.